

"How to Learn Muscle Control"

BY

OTTO ARCO

AND

ALAN CALVERT



HIS article, which is the first of a series, is the joint work of Otto Arco and myself. The division of labor is somewhat unequal. Arco does all the work of posing and supplies all the details of instruction. All that I do is to get the material together, to expand his all-too-brief notes, to comment on his ideas and attend to the publication.

Personally I have been familiar with the subject of muscle-control since thirty years ago, when I saw it demonstrated by Checkley, by Sandow and by the dozens of performers who imitated his posing act.

Sandow used muscle-control as a part of his posing; that is, many of his poses depended for their effectiveness on his ability to control, and thus display, his muscles. Those who reproduced his act, reproduced his poses, as well as they could; but there was no decided advance in the art of muscle-control until Arco came along.

He not only was able to duplicate all the control feats of his predecessor, but by reason of his study and knowledge, could and did, originate a lot of new feats; getting his own muscles under the control of his will to a degree that no one else has been able to even approximate—much less equal.

He taught much of what he knew to some of his personal friends and fellow artists, and there have been courses issued by others, courses based on information received from Arco. Which bothered him not at all. "For," as he says, "muscle control is a good thing for anyone to have. If I have helped these other fellows to teach it, I feel I have done both them and the public a good turn."

Since he has lived in the country he has been a perfect mine of information to those enthusiasts who are interested in the subject. Time and again, he has given up his time to answering letters begging for instruction on matters of detail; and has done so out of the kindness of his heart.

In that connection I must here say that Arco is an extremely busy man, with but little time for letter-writing. A set of articles like this, is sure to give some of you the idea of writing for personal advice. At present it is impossible for either of us to give personal instruction, but if any of you think that he must write to Arco, then please address your letter to him in care of this magazine. If your letter raises a question of *general*

interest—something which if answered would help other enthusiasts—it will be probably answered in these pages. If on the other hand the question is entirely personal, the letter may not be answered. Arco is working on this series at a considerable sacrifice of his own time and convenience; so let's not make it hard for him by asking him for purely personal service.

Shortly after this series was announced, Arco had to leave for an extended tour of the Orpheum Circuit; so some of you who live in the west have had the opportunity to see his act; and you probably noticed that his posing, his series of muscle control stunts, interested the audience even more than did his remarkable acrobatic feats.

His ability to make his muscles perform, his ability to control them, is positively weird; and seemingly his audiences are fascinated by his ability in that line.

He writes me that whenever he plays a return engagement at a theatre, the manager is almost sure to ask him to alter his act, so as to give more posing.

So he knows that people like his posing. He realizes that many who follow out these instructions will do so for the purpose of becoming able to amaze others by demonstrations of almost unbelievable control of the muscles.

But he contends that posing is merely a side issue. The main purpose of muscle-control is self-mastery. Muscle control involves far more than the mere ability to make the muscles contract. It teaches you to relax, which is sometimes even more important than contraction. It gives you a selective control, and therefore the ability to single out those muscles necessary to the work to be done, and *only* those muscles; leaving the antagonistic, or non-helpful, muscles relaxed. That makes a saving of energy in two ways; since it enables you to put all your energy into stimulating the needed muscles, and relieves those muscles of the interference of needlessly flexed antagonistic muscles.

Muscle control, which leads to body-control, is a great factor for success in all competitive sports. Your ability to shine in any outdoor game rests in your ability to make your body do exactly what you want it to do. Bodily control is the secret of that skill which is dependent on co-ordination and timing. As an illustration, Consider the style of a champion golfer as compared to a beginner. The expert makes his shot with perfect smoothness and rhythm, getting great distance and extreme accuracy, without any noticeable muscular exertion. He has his arms and body so thoroughly under control that he can perform any shot needed. The novice holds himself nervously tense, uses only his arms instead of employing a body swing, and gets nowhere. Only by repeated practice can he will his body so that it will respond to the commands of his will. Any golf instructor will tell you that there are some beginners who seem to be utterly lacking in body control. They cannot make their bodies behave, cannot carry out a single command; such as shifting the weight from one foot to another, executing a body swing, or a follow through; and even cannot imitate movements made by the instructor. Such men lack that bodily mastery which depends on muscle control.

It would be possible to go in and give several instances of the importance of bodily control in other sports, tennis, baseball, billiards, rowing, etc.

But Arco claims that the benefit that comes from learning muscle

control is not limited to its application to athletics. He says that it is even more helpfulness to the nervous system than to the muscles; because as each muscular contraction is the result of a nerve message your practice brings the nerves under control; not only gives you the power to stimulate the muscles to greater effort, but also enables you to relax, at will, both the nerves and muscles.

Anything which increases the domination of the mind over the body is a good thing. And anything which gives one "nerve," and cures "nerves," is likewise a good thing. You can use this muscle-control as a basis of acquiring will-control and nerve-control. If you happen to be a baseball pitcher you cannot only get that kind of muscle and body control which enables you to throw a ball how and where you want it to go; but you can further acquire that self-control which enables you to pitch perfectly in unfavorable conditions and before a hostile crowd.

Arco claims that learning muscle control will enable you to control your temper, to control your habits and, through strengthening your will power, to control your morals. That sounds like a large order, as though he was claiming too much; but the fact remains that will-power can be developed just the same way that a muscle can; viz. by intelligent use.

Neither Arco nor I claim that this practice of muscle-control will make the muscles very much bigger. But it will make them stronger by making them more alive, more responsive to the will, and it will alter and improve their shape because certain of the stunts can be performed only by the ultimate contraction of some muscles; and those muscles have to be gradually educated up to the point where they can make these extreme contractions.

There are other benefits which can be mentioned. This first article deals entirely with control of the upper back muscles, but where you come later on to the studies of abdominal control you will find that they will be of a great advantage to your digestive organs; the practice of the stunts affording the organs a sort of natural massage which does for them just what the rational exercise does for the muscles.

Personally I recommend all these muscle control stunts because they will help you in acquiring posture and balance and that absolute correctness of muscular co-ordination which does so much to promote the automatic growth of muscular tissue.

When I have trouble in teaching posture, it is because the man I am talking to is utterly unable to control the separate parts of his body. If I tell him to throw out his chest, he pulls back his shoulders; having no ability to move the chest independently of the shoulders. When I tell him to lift the front of the hips, he does just the opposite; and if I tell him to try and straighten the lower half of his spine, he is as helpless to obey as if I had asked him to do some difficult contortion stunt. I know that this muscle control will help in that respect.

INSTRUCTIONS

Before you can control your muscles, the first thing to learn is relaxation. When giving instruction in piano playing Padarewski will use the word "relax" dozens of times in one lesson. It is impossible to teach any set of muscles to contract in a certain way, to do something new, if the proper action of these muscles is limited and hampered by the contraction (tension) of other neighboring muscles.

So, you will find at the start that some of those stunts are impossible of performance unless you start off by relaxing; and that when Arco says to *relax* certain muscles he *means* it.

Take for a start the control of the shoulder blades, or to be accurate of the muscles which move the shoulder blades. It is a curious co-incidence that I should have written that editorial about the collar bones just before I started to prepare this article. Look at the pictures on pages 15 and 16. That exercise is really a muscle-control stunt; and for the shoulder blades. It is a simple elementary movement, which nevertheless, some of you will find it difficult to do at your first attempt. Now read on and see how much more completely and effectually Arco teaches you this control of the shoulder blades. He says; *first*, to sit in an arm-chair with your elbows resting on the chair-arms, and all your muscles relaxed. Now try and shrug your shoulders. In an ordinary shrug you would raise your shoulders towards your ears; but if you keep your arm muscles relaxed and your elbows against the arms of the chair, why! then your shoulders cannot rise. But the effort to "shrug" will result in a slight lifting of the shoulder-blades. You can feel them moving under the skin; feel them moving away from the ribs. With each day's practice you will gain extra control, become able to move the blades more and more independently of the rest of the body; and the blades instead of being muscle-bound, as before, will become looser; and you will have consequently more "play," more range of movement in the shoulders themselves.

The next step is to learn to do the same thing with the arms held out straight to the sides. Keep your arms still, with their muscles relaxed, and shrug the shoulders. You can easily tell whether you are successful by the feel of the shoulder-blades moving; crawling as it were up and down the back.

Then stand in front of your mirror with arms outstretched, and body completely relaxed. Jam your shoulder-blades together until they touch; then spread them as you would if you wanted to reach the furthest distance possible to the sides. (Same as on pages 15 and 16 A. C.)

Next try to do the *shrug* as you spread the blades (as in Figure 1); and relax the dorsal muscles (letting the shoulders drop) as you "jam"; and you will find that the shoulder-blades have been curling *outwards*.

Next—*relax* the back muscles *when spreading*; and *shrug* as you *jam* the shoulder-blades together, as in Figure II; and your shoulder-blades will circle *inwards*.

A good way of learning these movements is to stand with your back to a wall opposite the mirror; with your arms outstretched, and try to describe circles with your *shoulders*. Not with your *hands*, mind you; for the arms are always horizontal and relaxed; but the points of the shoulders should describe circles. Therefore watch not the arms but the shoulders. Don't be discouraged, if at first the movement is small. It is bound to be small in the case of every beginner, but the more you learn to control the blades, the more "play" there will be in the shoulders; and the more spectacular will be the movement.

The next exercise is the same, but instead of holding the arms out straight, as in Figures I and II, you bend them at the elbows as in Figures III and IV. ("If you do it this way, you somehow get the latissimus dorsi muscles spread further out to the sides. I can make myself two inches



FIGURE 1

wider across the back when I bend the elbows than when I hold the arms straight. I think I must have raised my shoulders, instead of spreading them, when posing for these two pictures as I should have looked much wider than I do.—*Arce.*) In the four preceding stunts it is very important to keep the arm muscles and trapezius muscles relaxed at all times; as that allows you to get the control of the back muscles which move the shoulder-blades.

Before attempting the next three stunts you should make a small ring of rope, or heavy cord, the ring to be about three inches in diameter. Slip the fingers in the ring, raise the arms straight above the head (reaching as high as possible), relax the shoulder muscles, keep the arms rigid, and then pull hard against the rope ring, as though you were trying to break it by moving the hands sideways and away from each other. Particular care should be taken *not* to bend the arms at the elbows.

If you do this while standing in front of a mirror, and if you will follow the directions properly, you will notice that the sides bulge a little bit, just below the level of the arm-pits. With each day's practice the bulge will become greater until finally the projections caused by the movement of the shoulder blades will appear as half circles as shown in Figures V, VI, and VII.

Supposing that you had your hands aloft as in Figure VII, *without* holding the rope ring or interlacing your fingers. When you brought the arms sideways and downwards, the motive power would be supplied by the muscles on the upper back; which are attached to the upper arm bones, and which by their contraction bring the arms down. But when you *do*



FIGURE II.

hold the rope-ring and pull vigorously against it, those back muscles contract; and because the arms are held together with the rope ring the effect is to lift the shoulder-blades apart.

When you first try it all your efforts should be devoted to pulling hard against the rope ring. As the practice continues, and the movement of the shoulder-blades becomes greater you should lessen the pull with the hands and concentrate on projecting the shoulder-blades to the sides.

After you have had fair success with No. VII try the same thing with the hands on top of the head as in Figures V and VI. When the arms are bent in this way it is more difficult to spread the shoulder-blades, and so this stunt is possible only after you have thoroughly mastered the stunt shown in Figure VII. In Figure VI you can just barely see the rope ring to which Arco is holding. Of course he can do this stunt without either holding on to a ring, or even clasping the hands; because he has his shoulder-blades under perfect control of his will. In conclusion, you must remember that you will not be able to accomplish either of the stunts shown in Figure V or VII unless you *raise the shoulders as high as possible* before you start to force the shoulder-blades apart. Also bear in mind that your control of the shoulder-blades is just as much dependent on your ability to relax some of the muscles, as it is on your ability to contract other muscles.

The odd effect in Figures V, VI and VII is due to the fact that the lower points of the shoulder blades have moved upward and outward.

Now, when the blades are in a *normal* position, they are maintained in that position by the combined action of several muscles. To make the lower points of the blades travel outward to the side, as in Figure VII, you have to contract the muscles which pull the points outwards, while relax-



FIGURE III

ing the opposing muscles, which, if contracted would pull the lower part of the blades inward and towards the spine.

That sounds rather complicated but it is something which you *must* understand before you can make any great progress in these, or in the following, stunts of muscle control. In the present case, if you flexed *all* the muscles attached to the shoulder-blades, and flexed them all with equal vigor, then the blade would remain immovable; but by flexing one set of muscles and relaxing its opposing set you can make the shoulder-blades move in almost any direction you wish.

Arco says that if you can master shoulder-blade control by continual practice, the very fact that you have subjected the upper back muscles to the control of the will, will make it easier for you to get a mental domination over the other muscles.

In learning to control the shoulder-blades in the four previous stunts you obtained a certain measure of control of the *trapezius* muscles; since in one or two of those movements the trapezius had to be contracted, and in the others had to be relaxed. Never forget that the word control means ability to *relax* the muscles at will, just as much as to contract them. The purpose of the stunts shown in Figures I to VII was, *first*, to enable you to move the shoulder-blades to and from each other (spread and jam); and, *second*, to move the lower points of the blades outward and upwards. The purpose of the next two stunts is to give you the power to control the trapezius (and some of the other muscles attached to the shoulder blades) so that you will be able to move the inner *edges* of the blades away from the spine.



FIGURE IV

Start out by gripping the rope-ring above your head as in Figure V; relax the shoulders and the back muscles completely. Keep pulling hard against the cord ring and slowly lower your outstretched arms to the front (in a half-circle movement,) until the hands are in front of the abdomen as in Figure VIII. (Arco has discarded the ring and is pulling on his left wrist with his right hand.) As your arms come down you will feel the inner edges of the shoulder-blades—the edges nearest the spine—pushing outwards against the skin. Then if you tilt your head back, the trapezius muscles will contract and stick out in those two huge lumps shown in Figures VIII and IX between the sides of the neck and the points of the shoulders.

The last stunt in this lesson is the one shown in Figure X. Rest the back of the hands against the lower part of the spine, and then press as hard against your back, with the back of the hands as you possibly can; at the same time raise your head up and tilt it back. This will make the inner edges of the shoulder-blades project slightly; and with practice you will finally be able to make them stick out as far as Arco's are in the picture.

I am fully aware that when some of our readers first see the accompanying pictures they may think that it would be foolish to put in a lot of time practicing for the sake of being able to distort their bodies into such positions. These pictures are spectacular, but to some they will seem unsightly. So I wish to repeat that the main object of the training is not the poses themselves, but the muscle control which makes those poses pos-



FIGURE V

sible." In other words the poses are not the end, but the means of training—of bringing all the body under the domination of your will.

As stated in the first part of this article both Mr. Arco and I are willing to answer questions in the pages of this magazine. I prepared this article under difficulties. Arco is a couple of thousand miles away, whereas he should have been sitting right along side of me to help me with his advice. When I requested him to pose for the pictures I suggested that in each pose he would flex only the muscles necessary to the performance of each stunt and he should deliberately relax all the other muscles of the body. He highly approved of this idea and carried it out except in one or two instances, when he obviously forgot himself. You see it is this way. When Arco is posing on the stage he always makes his body look its very best. Even if he is doing a stunt of abdominal control he will flex the muscles of his arms, shoulders, and legs so as to get a good *general* effect. It has become sort of a habit with him. But in pictures V, and VI he has flexed *only* the upper back muscles. I have other pictures showing him in this same pose where his shoulder blades project just as much, and where his upper arms look very much bigger and where the chest and abdomen are strongly flexed. Those pictures are much more wonderful than Figures V and VI, both because they show this power of simultaneous



FIGURE VI

control over all his muscles, and because his arms and the front half of his body are so impressive. So don't judge from the way Arco looks by those pictures V and VI. In them he is deliberately letting his arms relax to show you how *you* should let *your* arms relax.

If you will refer back, you will see that Arco said that in doing the stunts shown in I and II *all* the muscles should be relaxed. The next time I see him I am going to ask him to explain why it is that the upper arms and deltoid muscles are relaxed in Figure I and why they are so strongly flexed in Figure II. Whether the act of spreading the shoulders apart caused a contraction of the triceps and deltoids, or whether he forgot himself and flexed those muscles in doing pose II? The difference is very apparent in the two pictures. In I the right triceps is relaxed and hanging of its own weight. In II it is strongly contracted and the upper arm looks very much bigger than it does in Figure I.

You have thirty days in which to practice this group of stunts, but even in that length of time you can make considerable progress, *if* you devote a few minutes daily to practice. The difference between muscle control and other forms of exercise is, that muscular control does not produce any exhaustion; though it may cause local soreness. In fact Arco says that to master the pose shown in Figure VII may cause considerable pain and that the more pain you can stand the quicker progress you will make.



might think it would be hard to get the points of the blades back again where they belong—that is under the top edge of the larynx—as but they seem to slip back naturally into place. You need not be afraid of any permanent dislocation, for as you gain the ability to move the blades, it will give you gain an equal ability to replace them.

In writing the foregoing I have attempted to make it as clear as possibly is possible that the instructions given in *Arco's* series.

I frankly confess that there are one or two points where we do disagree. One of them is where I put my own interpretation of the example of the neck that *Arco* says is to be done by the neck muscles. So, for example, I use the word "trapezius" for the neck muscle. I have assumed that the neck muscles are the trapezius muscles. For an explanation of this I will be included in the next issue.

Also notice that *Arco* uses the word "shrug" to a different sense from what I would use it. If you, or I, were to shrug our shoulders we would lift the points of the shoulders two or three inches to the very level with the bottom of our ears. But *Arco* himself does not so; his shrugs are that way, a fact I have often noticed since he has the habit of "shrugging" as a substitute for saying unpleasant things. If he is told that someone is stealing his act, or is claiming credit for something he did, or if he is asked a question to which his answer would discredit someone, he neither protests in the first instance, nor does he reply in the second, but he smashes the disagreeable subject with a philosophical shrug of the shoulders. And when he shrugs he lifts the points of his shoulders very little—just sort of hunches up the shoulders and neck very much as in Figure VIII. So the question arises whether in the first stint, Figures I and II, when he says "shrug" he means to lift the points of the shoulders, as he seems to have done in Figure I, or whether he wants you to shrug as he does, with contraction of the trapezius muscle. I advise you to never to lift the *shoulders* as you will find it much easier to get the rotation of the shoulder blades than if you were to shrug by a contraction of the trapezius muscle.

This set of muscle-control stunts will be of great help to any man who is troubled by projecting shoulder blades. There are quite a number of people whose shoulder blades project at all times, not as much as in Figure X, perhaps, but still there will be a distinct ridge on either side of the spine, caused by the outward pressure of the inner edges of the shoulder blades. I have been consulted in many such cases, and I could tell that some of those who wrote to me actually *thought* that they were "stretched," whereas the cause of the trouble was nothing more than a bad muscular habit. The cure is to relax the trapezius muscles, and, after that is done, the blades will immediately fall into their normal position, and the upper back will be flat and snappy instead of being deformed with the two projecting ridges. So any of you that suffer from that disfigurement can remedy it by learning to relax. You will notice that *Arco* places a great deal of emphasis on this power of voluntary relaxation.

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FIGURE IX

muscle molders and in this muscle control section apparently reverse myself and recommend exercises which are to be performed every day. All I can say is that these exercises still work just as well as they ever did. The purpose in doing them is not just to exercise the muscles, but to enable them to increase their power to contract at will or even at the dictate of your will. I saw men who had no other tools but a few light dumb-bells for a half-hour every day contract their arms and shoulders all their trading life long and even the simplest stunts of muscle control. In this case I have never known a man lose the power of controlling his muscles once he has mastered it.

You will find some of these stunts very hard to learn, but it is a mystery that you will never use the body to make a comparison.

A man whose muscles are already large and powerful will find it easier to master the art of muscle control than will a man whose muscles have never been exercised. The trained gymnast or the accomplished athlete whose muscles are due to his ability to use his muscles with ease or muscle control finds with comparatively little trouble. But the man who lets his muscles become lax through neglect of exercise, or by allowing his body to sag will find it hard to master the stunts. The best muscle men are exactly the ones who most need to learn muscle control. An exercise involves alternate relaxation and contraction of the muscles. In learning these muscle control stunts you get that muscular contraction and relaxation without the exhaustion attendant on the performance of strenuous movements, bending exercises, or the more violent forms of sports and athletics.





FIG. 12. 11

[illegible]

What these secrets are I don't know. I think that you are using a lot of them, you tell me. I've got to get myself and pass them on to you without realizing that I was doing it.



FIG. 10. A. 1.

A. 1. The view which is given in the article. It shows a child in a relaxed position, the arms are raised above the head, the legs are bent at the knees, the feet are flat on the floor. The child is wearing a light-colored garment. The background is dark and indistinct.

How to Learn Muscle Control

(Second Lesson)

BY

OTTO ARD

AND

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Let us start by assuming that you have practiced the stunts shown in Figures I to IV in the August issue, that you have advanced so far that you can move the shoulder blades up or down, towards or away from the spine when you have your arms extended out to the side. Perhaps you have gone even further, and you move the shoulder blades in side-wise circles, as suggested by Arce.

If so, you have made a start. *Let me* start. To contract a muscle, and thereby move some part of the body in one direction or another, when you place the body in a position favorable to that contraction. It becomes difficult when you attempt to make the contraction without the assistance of favorable positions. If you extend the arms sidewise and reach far out with both hands, or both elbows, then the shoulder blades simply have to move away from each other. The test of your control is whether or not you can stand with the arms hanging limp at your sides, and then spread the shoulders apart, by merely *willing* them to move.

Again, while you will very soon learn to thus spread the blades apart (or, what is easier, to squeeze them together), you will have some trouble in learning to raise and lower them.

Undoubtedly, it helps you to get this power of up and down movement if you first move the shoulders in those side-wise circles. That is, move the points of the shoulders, since the shoulder blades, being fastened to the shoulder joint, have their position affected by every movement of that joint. And just as soon as you can move the shoulder blades in that way, *then* you must learn to keep the shoulders themselves motionless, and make the shoulder blades circle around apparently of their own will and volition.

Perhaps your shoulders *will not* "let" you at first, especially



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this stunt in their posing acts. Although you are not apt to do any public posing, you should include this in your practice because it helps to give you control; the power of voluntary movement of one of a pair of muscles.

You will find as you advance in this game that when there are a pair of muscles—one on either side of the medial line, (i.e., a right and a left) it is easiest to flex them simultaneously. And that it requires a new degree of concentration and control before you can relax one of the pair and make the other work independently.



FIGURE XIV

Attached to the ribs are a set of muscles known as the *serratus magnus*, which are attached at their rear ends to the inside of the shoulder blades—pass between the shoulder blades and the ribs—and are fastened at their front ends to the ribs themselves. You can see them in Figure XIV on either side of the chest. In most men they are so little developed that they do not affect the surface form, but in powerfully developed men they are very prominent. You will see them outlined on the bodies of many of the ancient statues, particularly when the subject is represented in vigorous action.

(These muscles appear on the sides of the chest as a set of digitations—resembling a row of saw teeth.)

These muscles are involved in the control of the shoulder blade, since when the chest is inflated and the ribs fixed in position the contraction of the *serratus magnus* muscle spreads the



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If you are a student of anatomy and have developed men you may have noticed that these serratus magnus muscles are to be seen on the *best* developed men. You will see pictures of many athletes who show the amazing old shoulder muscles and well defined and clean-cut muscles on the breast, abdomen and upper back. You rarely see them reveal even an indication of the serratus muscle. Every athlete has them of course, but it is the cases where the muscles are less developed than any others on the body, and in other cases the men may not know how to display them.

One reason a sculptor creates a neglected part is that such a small part of them can be seen. On the other hand parts lie right under the skin and greater part being covered by the skin and the fat of the muscles. Again these muscles are further concealed by the body, as arm movements, practice of physical exercises. Their function is more to have the body start and move than to allow. One authority says that these are the muscles which furnish most of the power when a man makes a throw, than that is so they must be trained to work in a very good fund and must help in throwing a ball.

The next class would find men with highly developed abdomens and the serratus muscles are not that much seen. A man who has great pectus muscles in the back and good



FIGURE XV

muscles of the sides of the waist, he is almost sure to have excellent *serratus* muscles.

One reason why this muscle control practice is so valuable is because it brings you into close acquaintance with muscles which are neglected in other training systems. In the editorial in the first part of this issue, you are given a few exercises for *lateral* muscles. The one shown in figures VI and VII is an excellent developer of the *serratus*.

It is a well known fact to those who have specialized on the subject, that the *sportsmen*—the professional or amateur strong men—can display the strength of two ordinary men. Not because their muscles are so much bigger than those of their weaker competitors, but because they use so many more of their muscles, and use the proper muscles at the right time. There are ways of doing feats by using the arms only—which mean small results and great exertion—and there are other ways of reinforcing the arms with the strength of the body—muscles which control and actuate the upper arms, which transforms the stunt from a feat of arm strength, to a feat of *body* strength. In the latter case the exertion is far less and the results obtained are *many* times greater. The moral is that by learning how to use your body muscles you can double and perhaps triple the amount of force you can put in an arm movement.

There is nothing better than the muscle control to bring your body muscles under your command.

CONTROL OF THE BREAST MUSCLES

One of the principal functions of the pectoral muscles will be the *shoulder* muscles. At the least, it is to bring the arms toward each other. If you hold the arms straight and press them in front of you, the pectoral muscles are contracted, and will use in two hard rounds of muscle, that is if the muscles have any development to start with.

The easiest way to learn to control them is to place the palms of the hands together as in Figure XVI and then press the hands together as hard as possible. That is bound to make the pectoral muscles contract to the limit. Try this in front of



FRANK ZANE

you can manipulate that just as soon as a reflex. He presses it with the hands, the pectoral muscles relax. ■ **Suffer.**

So, in order to get into the zone, what you have to do is you have to consciously press, consciously press, consciously. And every time you consciously press, you're not going to get into the best state, it's just not a reflex. ■ **Work it out.**

The next topic we start with is the posture, the position, the lateral to the contraction of the pectorals. So, it's a very important pressure with the hands, and to force the contraction with power. To this, by putting the shoulders together as in Figure



1. *Bodybuilding* is a sport in which athletes train to develop and display extreme muscle mass and definition. It involves a combination of resistance training and dieting to achieve the desired physique.

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1. The first step is to identify the problem.

2. The second step is to define the problem.

3. The third step is to analyze the problem.

4. The fourth step is to develop a solution.

5. The fifth step is to implement the solution.

6. The sixth step is to evaluate the solution.

7. The seventh step is to monitor the solution.

8. The eighth step is to maintain the solution.

9. The ninth step is to improve the solution.

10. The tenth step is to document the solution.

11. The eleventh step is to communicate the solution.

12. The twelfth step is to review the solution.

13. The thirteenth step is to update the solution.

14. The fourteenth step is to archive the solution.

15. The fifteenth step is to delete the solution.

16. The sixteenth step is to restore the solution.

17. The seventeenth step is to backup the solution.

18. The eighteenth step is to recover the solution.

19. The nineteenth step is to migrate the solution.

20. The twentieth step is to clone the solution.

21. The twenty-first step is to split the solution.

22. The twenty-second step is to merge the solution.

23. The twenty-third step is to move the solution.

24. The twenty-fourth step is to copy the solution.

25. The twenty-fifth step is to paste the solution.

26. The twenty-sixth step is to print the solution.

27. The twenty-seventh step is to save the solution.

28. The twenty-eighth step is to load the solution.

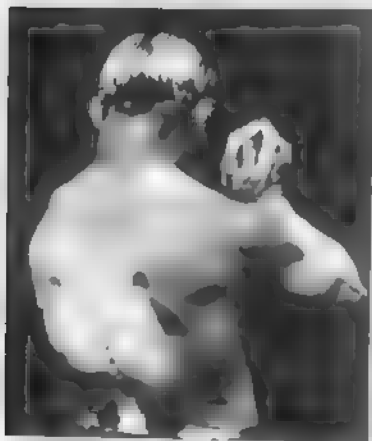
29. The twenty-ninth step is to unload the solution.

30. The thirtieth step is to delete the solution.

31. The thirty-first step is to restore the solution.

32. The thirty-second step is to backup the solution.

33. The thirty-third step is to recover the solution.





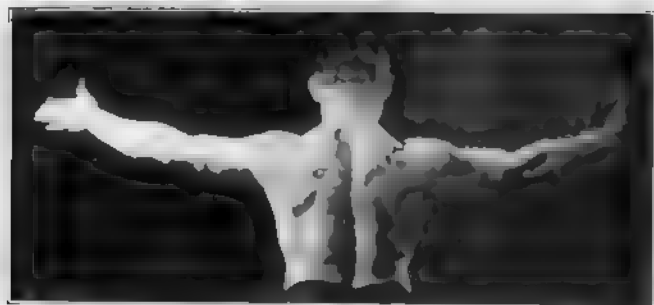
How to Learn Muscle Control.

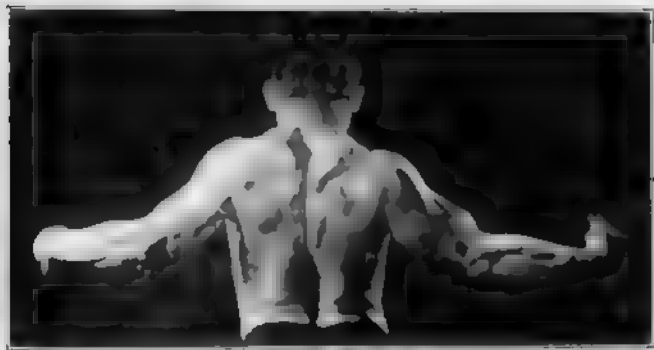
By

W. H.



1. The first step in learning muscle control is to understand the basic principles of muscle function. This involves studying the anatomy of the muscles and the nervous system, and understanding how they work together to produce movement. 2. The second step is to develop a strong foundation of basic motor skills. This includes learning how to stand, walk, and balance, and how to control the muscles of the arms and legs. 3. The third step is to learn how to control the muscles of the trunk and neck. This involves learning how to sit, stand, and move the head and neck in a controlled manner. 4. The fourth step is to learn how to control the muscles of the upper extremities. This involves learning how to reach, grasp, and manipulate objects with the hands and arms. 5. The fifth step is to learn how to control the muscles of the lower extremities. This involves learning how to walk, run, and jump in a controlled manner. 6. The sixth step is to learn how to control the muscles of the respiratory system. This involves learning how to breathe in and out in a controlled manner. 7. The seventh step is to learn how to control the muscles of the digestive system. This involves learning how to eat and drink in a controlled manner. 8. The eighth step is to learn how to control the muscles of the circulatory system. This involves learning how to pump blood in and out of the heart in a controlled manner. 9. The ninth step is to learn how to control the muscles of the excretory system. This involves learning how to urinate and defecate in a controlled manner. 10. The tenth step is to learn how to control the muscles of the reproductive system. This involves learning how to reproduce in a controlled manner.





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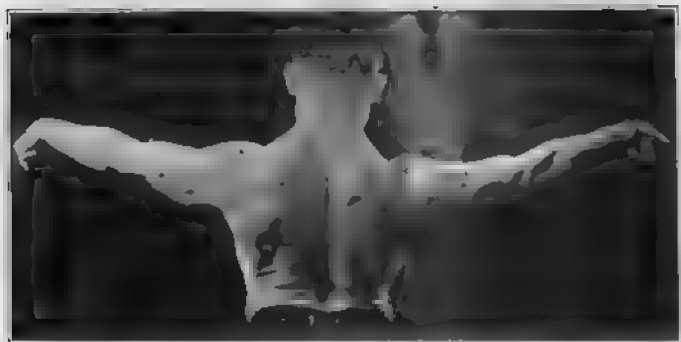


FIGURE XXV

Figures XXIV and XXV are views of the subject's back and front, respectively. The arms are extended horizontally to the sides, palms facing forward. The subject is standing on a light-colored surface. The background is dark. The subject's arms are slightly relaxed, and the hands are open. The subject's head is turned slightly to the right. The subject's legs are straight and close together. The subject's feet are flat on the ground. The subject's torso is upright. The subject's shoulders are broad. The subject's neck is long. The subject's head is large. The subject's face is oval-shaped. The subject's eyes are dark. The subject's nose is straight. The subject's mouth is closed. The subject's hair is dark and short. The subject's skin is light-colored. The subject's overall appearance is that of a young man.

As an effect of the subject's arms being extended horizontally to the sides, the subject's torso is slightly arched. The subject's head is turned slightly to the right. The subject's legs are straight and close together. The subject's feet are flat on the ground. The subject's torso is upright. The subject's shoulders are broad. The subject's neck is long. The subject's head is large. The subject's face is oval-shaped. The subject's eyes are dark. The subject's nose is straight. The subject's mouth is closed. The subject's hair is dark and short. The subject's skin is light-colored. The subject's overall appearance is that of a young man.

Figure XXVI shows the subject's back and front, respectively. The arms are extended horizontally to the sides, palms facing forward. The subject is standing on a light-colored surface. The background is dark. The subject's arms are slightly relaxed, and the hands are open. The subject's head is turned slightly to the right. The subject's legs are straight and close together. The subject's feet are flat on the ground. The subject's torso is upright. The subject's shoulders are broad. The subject's neck is long. The subject's head is large. The subject's face is oval-shaped. The subject's eyes are dark. The subject's nose is straight. The subject's mouth is closed. The subject's hair is dark and short. The subject's skin is light-colored. The subject's overall appearance is that of a young man.

In Figure XXVII, the subject's arms are extended horizontally to the sides, palms facing forward. The subject is standing on a light-colored surface. The background is dark. The subject's arms are slightly relaxed, and the hands are open. The subject's head is turned slightly to the right. The subject's legs are straight and close together. The subject's feet are flat on the ground. The subject's torso is upright. The subject's shoulders are broad. The subject's neck is long. The subject's head is large. The subject's face is oval-shaped. The subject's eyes are dark. The subject's nose is straight. The subject's mouth is closed. The subject's hair is dark and short. The subject's skin is light-colored. The subject's overall appearance is that of a young man.



1. *Phragmites australis* (Cav.) Trin. ex Steud.
 2. *Scirpus americanus* (L.) Pers.
 3. *Spartina patens* (Muhl.) B. & P.

1. *Journal of the American Medical Association*, 1997; 277: 1033-1038.

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cases that have been recorded. In the case of the 1956-57 season, the rainfall was 100% of the normal for the first 10 months of the year, but in the last month it was only 50% of the normal. The total rainfall for the year was 100% of the normal. The temperature was 100% of the normal for the first 10 months of the year, but in the last month it was only 50% of the normal. The total temperature for the year was 100% of the normal.

The 1956-57 season was a very wet year. The rainfall was 100% of the normal for the first 10 months of the year, but in the last month it was only 50% of the normal. The total rainfall for the year was 100% of the normal. The temperature was 100% of the normal for the first 10 months of the year, but in the last month it was only 50% of the normal. The total temperature for the year was 100% of the normal.

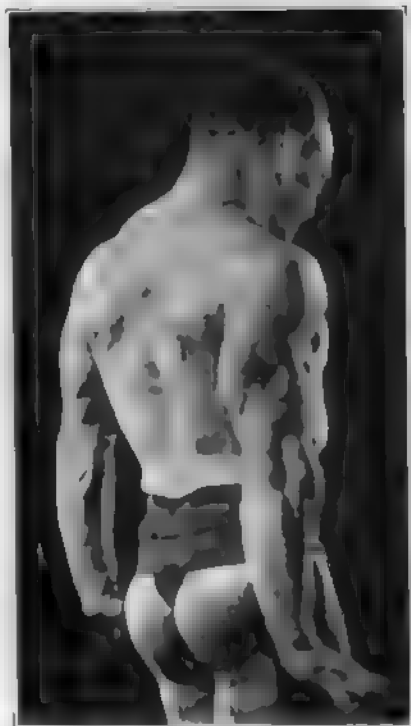
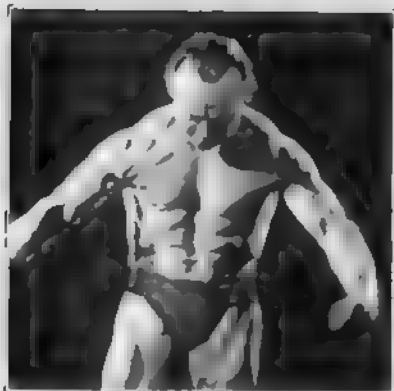


FIGURE 1

The 1956-57 season was a very wet year.

The 1956-57 season was a very wet year. The rainfall was 100% of the normal for the first 10 months of the year, but in the last month it was only 50% of the normal. The total rainfall for the year was 100% of the normal.

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APPROPRIATE WORK

It is important to understand that the concept of appropriate work is not a simple one. It is a complex of many factors, including the individual's physical condition, the nature of the work, and the environment.

The first factor is the individual's physical condition. This includes the individual's age, sex, and overall health. A young, healthy male is likely to be able to perform more physically demanding work than an older, less healthy female.

The second factor is the nature of the work. Some work is more physically demanding than others. For example, a construction worker is likely to be able to perform more physically demanding work than an office worker.

The third factor is the environment. The environment can have a significant impact on an individual's ability to perform work. For example, a worker in a hot environment may be unable to perform as much work as a worker in a cool environment.

Understanding these factors is important for employers and workers alike. Employers need to know what work is appropriate for their employees, and workers need to know what work is appropriate for them.

One way to determine if a job is appropriate for an individual is to look at the individual's physical condition. If the individual is young, healthy, and has no known physical limitations, then the job is likely to be appropriate.

Another way to determine if a job is appropriate for an individual is to look at the nature of the work. If the work is not physically demanding, then the job is likely to be appropriate.

Finally, the environment can also be a factor. If the environment is not conducive to the work, then the job is likely to be inappropriate.

Understanding these factors is important for employers and workers alike. Employers need to know what work is appropriate for their employees, and workers need to know what work is appropriate for them.

It is important to understand that the concept of appropriate work is not a simple one. It is a complex of many factors, including the individual's physical condition, the nature of the work, and the environment.



The man in the photograph is a professional bodybuilder. He has a very low body fat percentage, which makes his muscles appear very defined. He is in a classic bodybuilding pose, showing off his chest and abdominal muscles.

Bodybuilders like the man in the photograph spend a lot of time in the gym. They lift weights and perform other exercises to build muscle and lose fat. They also eat a diet that is high in protein and low in fat and carbohydrates.

Bodybuilding is a popular sport, and many people participate in it. Some people participate in it for fun, while others participate in it to win money. The man in the photograph is a professional bodybuilder, which means he competes in bodybuilding competitions and wins money.

Bodybuilding is a challenging sport, and it takes a lot of time and effort to become a professional bodybuilder. The man in the photograph has spent a lot of time and effort on his physique, and he is now a professional bodybuilder.

Bodybuilding is a sport that is growing in popularity. More and more people are participating in it, and more and more people are watching it. The man in the photograph is a professional bodybuilder, and he is one of the best in the world.

Bodybuilding is a sport that is growing in popularity. More and more people are participating in it, and more and more people are watching it. The man in the photograph is a professional bodybuilder, and he is one of the best in the world.





When the clay is in the state of plasticity, it is called *plastic clay*. It is the most common state of clay, and is the one in which it is most useful. It is the state in which it is most easily worked, and in which it is most likely to retain its shape. It is the state in which it is most likely to be used in the manufacture of pottery, and in the construction of bricks and tiles. It is the state in which it is most likely to be used in the construction of buildings, and in the construction of roads and bridges. It is the state in which it is most likely to be used in the construction of ships, and in the construction of aircraft. It is the state in which it is most likely to be used in the construction of machinery, and in the construction of electrical equipment. It is the state in which it is most likely to be used in the construction of all kinds of structures, and in the construction of all kinds of objects.

The plasticity of clay is due to the presence of water. The water molecules are attracted to the clay particles, and form a thin layer of water around each particle. This layer of water is called the *water film*. The water film is the reason why clay is plastic. It is the reason why clay can be shaped into any form, and why it can be used in the manufacture of pottery, and in the construction of bricks and tiles. It is the reason why clay is so useful in the construction of buildings, and in the construction of roads and bridges. It is the reason why clay is so useful in the construction of ships, and in the construction of aircraft. It is the reason why clay is so useful in the construction of machinery, and in the construction of electrical equipment. It is the reason why clay is so useful in the construction of all kinds of structures, and in the construction of all kinds of objects.



How to Learn Muscle Control

BY
C. T. VANCE
AND
A. S. L. HUNT

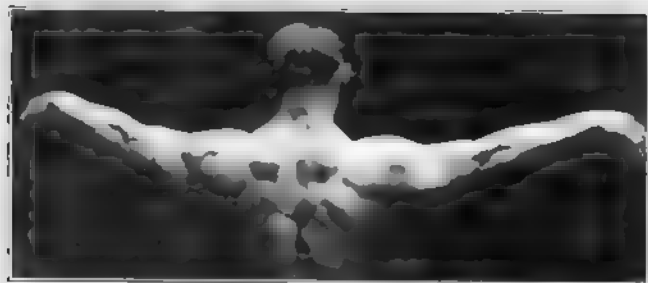


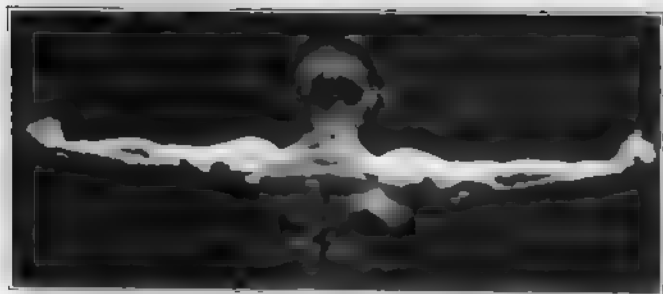
MUSCLE CONTROL is a new and important book for all who are interested in the science of physical education. It is a book that will help you to understand the principles of muscle control and to apply them in your own practice. The book is written by two of the leading authorities on the subject, C. T. Vance and A. S. L. Hunt. It is a book that is both practical and scientific. It is a book that will help you to learn the principles of muscle control and to apply them in your own practice. The book is written by two of the leading authorities on the subject, C. T. Vance and A. S. L. Hunt. It is a book that is both practical and scientific. It is a book that will help you to learn the principles of muscle control and to apply them in your own practice.



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| USA | 1990 | 1.00 | 1000 |
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| USA | 1992 | 1.00 | 1000 |
| USA | 1993 | 1.00 | 1000 |
| USA | 1994 | 1.00 | 1000 |
| USA | 1995 | 1.00 | 1000 |
| USA | 1996 | 1.00 | 1000 |
| USA | 1997 | 1.00 | 1000 |
| USA | 1998 | 1.00 | 1000 |
| USA | 1999 | 1.00 | 1000 |
| USA | 2000 | 1.00 | 1000 |
| USA | 2001 | 1.00 | 1000 |
| USA | 2002 | 1.00 | 1000 |
| USA | 2003 | 1.00 | 1000 |
| USA | 2004 | 1.00 | 1000 |
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| USA | 2007 | 1.00 | 1000 |
| USA | 2008 | 1.00 | 1000 |
| USA | 2009 | 1.00 | 1000 |
| USA | 2010 | 1.00 | 1000 |
| USA | 2011 | 1.00 | 1000 |
| USA | 2012 | 1.00 | 1000 |
| USA | 2013 | 1.00 | 1000 |
| USA | 2014 | 1.00 | 1000 |
| USA | 2015 | 1.00 | 1000 |
| USA | 2016 | 1.00 | 1000 |
| USA | 2017 | 1.00 | 1000 |
| USA | 2018 | 1.00 | 1000 |
| USA | 2019 | 1.00 | 1000 |
| USA | 2020 | 1.00 | 1000 |
| USA | 2021 | 1.00 | 1000 |
| USA | 2022 | 1.00 | 1000 |
| USA | 2023 | 1.00 | 1000 |
| USA | 2024 | 1.00 | 1000 |
| USA | 2025 | 1.00 | 1000 |
| USA | 2026 | 1.00 | 1000 |
| USA | 2027 | 1.00 | 1000 |
| USA | 2028 | 1.00 | 1000 |
| USA | 2029 | 1.00 | 1000 |
| USA | 2030 | 1.00 | 1000 |
| USA | 2031 | 1.00 | 1000 |
| USA | 2032 | 1.00 | 1000 |
| USA | 2033 | 1.00 | 1000 |
| USA | 2034 | 1.00 | 1000 |
| USA | 2035 | 1.00 | 1000 |
| USA | 2036 | 1.00 | 1000 |
| USA | 2037 | 1.00 | 1000 |
| USA | 2038 | 1.00 | 1000 |
| USA | 2039 | 1.00 | 1000 |
| USA | 2040 | 1.00 | 1000 |
| USA | 2041 | 1.00 | 1000 |
| USA | 2042 | 1.00 | 1000 |
| USA | 2043 | 1.00 | 1000 |
| USA | 2044 | 1.00 | 1000 |
| USA | 2045 | 1.00 | 1000 |
| USA | 2046 | 1.00 | 1000 |
| USA | 2047 | 1.00 | 1000 |
| USA | 2048 | 1.00 | 1000 |
| USA | 2049 | 1.00 | 1000 |
| USA | 2050 | 1.00 | 1000 |
| USA | 2051 | 1.00 | 1000 |
| USA | 2052 | 1.00 | 1000 |
| USA | 2053 | 1.00 | 1000 |
| USA | 2054 | 1.00 | 1000 |
| USA | 2055 | 1.00 | 1000 |
| USA | 2056 | 1.00 | 1000 |
| USA | 2057 | 1.00 | 1000 |
| USA | 2058 | 1.00 | 1000 |
| USA | 2059 | 1.00 | 1000 |
| USA | 2060 | 1.00 | 1000 |
| USA | 2061 | 1.00 | 1000 |
| USA | 2062 | 1.00 | 1000 |
| USA | 2063 | 1.00 | 1000 |
| USA | 2064 | 1.00 | 1000 |
| USA | 2065 | 1.00 | 1000 |
| USA | 2066 | 1.00 | 1000 |
| USA | 2067 | 1.00 | 1000 |
| USA | 2068 | 1.00 | 1000 |
| USA | 2069 | 1.00 | 1000 |
| USA | 2070 | 1.00 | 1000 |
| USA | 2071 | 1.00 | 1000 |
| USA | 2072 | 1.00 | 1000 |
| USA | 2073 | 1.00 | 1000 |
| USA | 2074 | 1.00 | 1000 |
| USA | 2075 | 1.00 | 1000 |
| USA | 2076 | 1.00 | 1000 |
| USA | 2077 | 1.00 | 1000 |
| USA | 2078 | 1.00 | 1000 |
| USA | 2079 | 1.00 | 1000 |
| USA | 2080 | 1.00 | 1000 |
| USA | 2081 | 1.00 | 1000 |







ADVANCED BICEPS CONTROL



FIGURE I.

Of course, there are other display stunts which can be suggested. An effective one is to face your audience; clasp your hands on top of your head and alternately flex and relax the biceps; first simultaneously; then right flexed, left relaxed; and then vice-versa *rapidly*. Putting the hands on the head lets you fully relax the biceps and make the subsequent contractions seem greater by comparison. When you bend the arm and hold the elbows up, there is found to be some tension on the muscles which raise the arm; among which is the biceps. When you rest the hands on the crown of the head that support enables you to relax the muscles fully. That is one of the little things which are a help to beginners.

(And by the way, you probably recognized Figure XLIX. It was used in the first circular announcing this magazine. Also it is part of the full-length picture of Arco which appeared on page 25 of "THE BROAD OF THE BACK." The arm was not so noticeable in that pose because it seemed to fit in so exactly with the width of the shoulders and the breadth of the back. When I wanted a picture of Arco's arm for the circular, I reproduced only that part of the photograph shown in XLIX. I centered the picture so that I practically compelled you to fix your gaze on the shoulder and upper-arm. Arco himself says that he thinks it is a wonderful view of his arm.)

THE FORE-ARM

If you have ever studied pictures of well-muscled athletes, or if you

it by pushing strongly away with the hand, and by putting his thumb in the queer position shown. I can't tell you how to do it—can't explain it. It must be partly due to the amount of tension you put on the muscle. It isn't easy. We took four shots with the camera before we got it. The strain of concentration is reflexed in the facial expression.

In getting control, the foregoing is about all you need.

have examined your physique by aid of a mirror, you must have noticed that it is hard to make the forearm and upper-arm look big at the same time.

When the upper-arm looks its biggest, the forearm is almost bound to look small, because you see it from the side (XLVI). On the contrary when you fix your arm so that the forearm seems very big, you are disappointed to note that the position is not the best for displaying the upper-arm. Perhaps the best combined effect is when the arm is bent half-way, as in XLIX, for then if you have the control, you can make the biceps stand up, can also harden the triceps to put the curve on the under side of the arm, and make the forearm much wider than when the arm is fully bent.



FIGURE LI

What gives the breadth to the forearm in XLIX is the tightening of the supinator longus muscle. You will note on the picture that the lower edge of the forearm is one almost straight line, starting near the base of the thumb and cutting into the upper arm just in front of where the biceps start. The lower tendon of that muscle is fastened to the lower end of the *outer* bone of the forearm. Its upper tendon is fastened to the upper-arm bone, a couple of inches above the elbow. As its name implies it is one of the muscles which rotate the forearm; but because it crosses the elbow-joint, it helps bend the arm at the elbow when it contracts.

It is easy to get control of the supinator; in fact you may get it unconsciously while you are mastering the biceps. But it will not hurt to learn a little about its action. So stand facing your mirror; raise your arm to the side; bend it half-way at the elbow so that the forearm is perpendicular and palm of hand towards the mirror. Now tighten your biceps' muscle. As the biceps hump up, you will see the supinator tighten. The forearm near the elbow will suddenly become almost fifty per cent thicker than before. The ability to make the supinator stand out increases very quickly.

To make the forearm look its very biggest, it is necessary to flex and



FIGURE 1.11

control all of its muscles; as Argo is doing in 1.11. To duplicate the pose you have to bend your arm; tighten the supinator and then clench your fist and bend the wrist. As the palm of the hand is depressed then the hand itself must be rotated away from you, until the forearm is in what some call the "goose-neck position." You will never get those flexors on the *inside* of the forearm fully contracted if you merely bend the hand over. You have to rotate it as you bend. It enables you to contract the muscles so strongly that they *cramp*. And of course you have to do all that without once re-

laxing the supinator. You will be surprised how your forearm will actually build up by practicing this stunt. The gain in control is almost always accompanied with a gain in size and shape.

The foregoing reads more like an article on arm display than like a lesson in muscle-control. The answer is that muscle-posing (muscular display) is *based* on muscle-control. That part about the forearm is an instance. You can't get the display unless you can make the muscles do what you want them to do.

—When I first saw Sandak, again he gave the impression that he could alter the size and shape of his forearm at will. After doing the "goose-neck," he would open his hand, straighten the wrist and let all the forearm muscles go lax; and he would "goose-neck," relax; and repeat several times

quickly. His forearm seemed to literally double in size while you were watching it. This makes an ideal exercise providing you with alternate full contraction and full relaxation.

There is an advantage about this muscle-control which makes a great appeal to the non-athletes; especially to the man who wants exercise without the fatigue and soreness which

follows violent work. You can practice muscle-control to the limit, and finish up fresh. And if you have spent half the time in alternating relaxation with contraction you never have any sore muscles.



FIGURE LIII



FIGURE XLIX